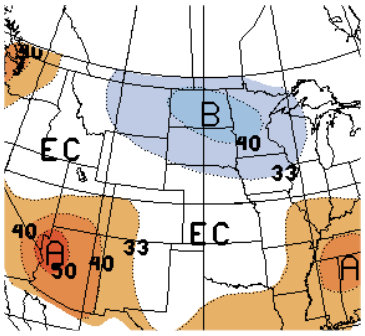
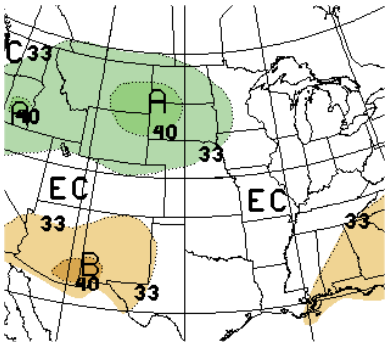
The Summer and Autumn Weather Outlook for Northeast Montana and El Nino Explained

By Corey Bogel, General Forecaster

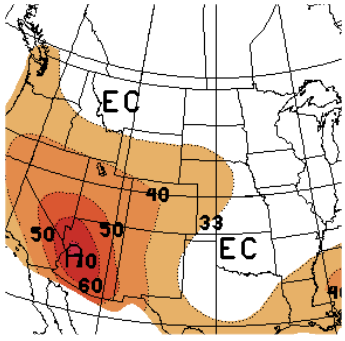
The latest official climate outlook (issued May 19, 2005) from the Climate Prediction Center (CPC) is for below average temperatures with above average precipitation this summer. There is an equal chance of either above or below average temperatures and precipitation this fall. It is still a long way out, but there is some signal that temperatures may be above average this winter, with below average precipitation should a weak El Nino re-develop.



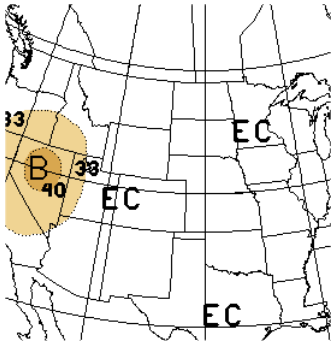
June-July-Aug **Temperature** Outlook



June-July-Aug **Precipitation** Outlook



Aug-Sept-Oct **Temperature** Outlook



Aug-Sept-Oct **Precipitation** Outlook

EC refers to equal chances of above or below normal conditions.

So, what is El Nino? The term El Nino refers to the large-scale ocean-atmosphere climate phenomenon linked to a periodic warming in sea-surface temperatures across the central and east-central equatorial Pacific (between approximately the date line and 120W). La Nina is the opposite of an El Nino and refers to the periodic cooling of ocean surface temperatures in the central and east-central equatorial Pacific that occurs every 3 to 5 years or so.

Why does an El Nino/La Nina form? El Nino and La Nina are naturally occurring phenomena that result from interactions between the ocean surface and the atmosphere over the tropical Pacific. Changes in the ocean surface temperatures affect tropical rainfall patterns and atmospheric winds over the Pacific Ocean, which in turn impact the ocean temperatures and currents. The El Nino and La Nina related patterns of tropical rainfall cause changes in the weather patterns around the globe.

During the summer of 2004 a weak El Nino developed. The El Nino came to an end as of the spring of 2005. The most recent El Nino was weak, but was, at least in part, responsible for the warmer and drier winter across Northeast Montana.

The current forecast is for ENSO-neutral conditions this summer into the fall. ENSO-neutral refers to those periods when neither El Nino nor La Nina is present. These periods often coincide with the transition between El Nino and La Nina events.

There is the possibility of a warming to a borderline weak El Nino again by this winter, but it is still highly uncertain as to whether the El Nino will re-develop. Should a weak El Nino form, it would be the same conditions which, in part, may have led to a warm winter last year across northeast Montana.

You might be wondering how long El Nino and La Nina typically last? El Nino typically lasts 9-12 months, and La Nina typically lasts 1-3 years. They both tend to develop during March-June, reach peak intensity during December-April, and then weaken during May-July. However, prolonged El Niño episodes have lasted 2 years and even as long as 3-4 years.

El Nino and La Nina are typically strongest during December-April because the equatorial Pacific sea-surface temperatures are normally warmest at this time of the year. Consequently, a slight warming of the waters due to El Nino can result in a major redistribution of tropical convective rainfall, whereas a slight cooling due to La Nina can restrict the tropical convection to Indonesia. This redistribution of tropical convective rainfall affects the jet stream - which is the current of wind at about 20,000 feet above the Earth's surface. There tends, during El Nino event, to be an enhanced flow of marine air into the western United States, along with a reduced northerly flow of cold air from Canada into the western U.S. These conditions result in a milder than normal winter across the northern state and western Canada. The correlation to winter precipitation (mostly snowfall in northeast Montana) is not as strong. There is a strong correlation that above normal precipitation falls during El Nino events in California, along the Gulf Coast, and southeast U.S. due to an active southern branch of the jet stream.

How do scientists detect El Nino and La Nina and predict their evolution? Scientists from NOAA (National Oceanic and Atmospheric Administration) and other agencies use a variety of tools and techniques to monitor and forecast changes in the Pacific Ocean and the impact of those changes on global weather patterns. In the tropical Pacific Ocean, El Niño is detected by many methods, including satellites, a network of 70 buoys, sea level analysis, and expendable buoys.

If you have any questions concerning El Nino or La Nina and their impact on the weather in northeast Montana, please contact either Donald Simonsen, the climate focal point, or Corey Bogel, the assistant climate focal point.

To see the latest climate outlooks which are issued in the third week of each month, you can go to: http://www.cpc.noaa.gov/products/predictions/30day/